



# Don't Waste eWaste: UnMaking a Canon Printer/Scanner/Fax into Parts

Written By: David Nutty

## **TOOLS:**

- [#0 or #00 Philips Screwdriver \(1\)](#)
- [Small Flathead Screwdriver \(1\)](#)
- [Wire cutter/stripper \(1\)](#)
- [parts bin \(1\)](#)

## **SUMMARY**

This guide will unmake a Canon printer/scanner/fax into Maker resources. We are mainly going for the motors but so much more will come out of this eWaste. The principles and techniques here apply to unmaking most fabricated electronics ... a Phillips screwdriver is about as complicated a tool as you will need ... and something to pry with! Remember that most products are made by robotics or unskilled labor that needs to be able to snap and assemble pieces onto a moving stream of work in progress ... nothing fancy is involved in the assemblage once 10,000 engineers figure out all the parts involved.

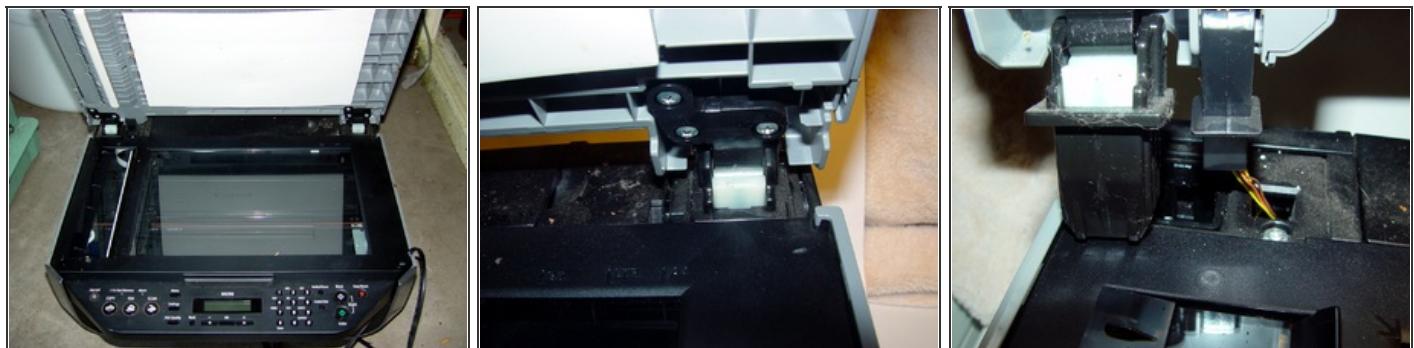
So let's disassemble someone else's product.

## Step 1 — Break it Down!



- This is a multi-function machine so we will have a printer, a scanner (copier & fax), and miscellaneous paper trays and feeds. Should be lots of parts.
- Take apart the machine in chunks that are manageable and make sense (printer, scanner, paper tray, etc.). Work on each section before breaking down the next. Try to keep things separated in trays as you work instead of lumping them into a pile.
- Get rid of the messy stuff! If the eWaste still has toner or ink cartridges bag them up and dispose of them at a recycling center (or mail them to one). Any other messy bits need to be cleaned before tearing down.
- Look for screws and tab connections. The basic idea is to remove any screws you can find - see if parts come off - if not, look for things to pry off.

## Step 2 — Paper Tray: Remove It!



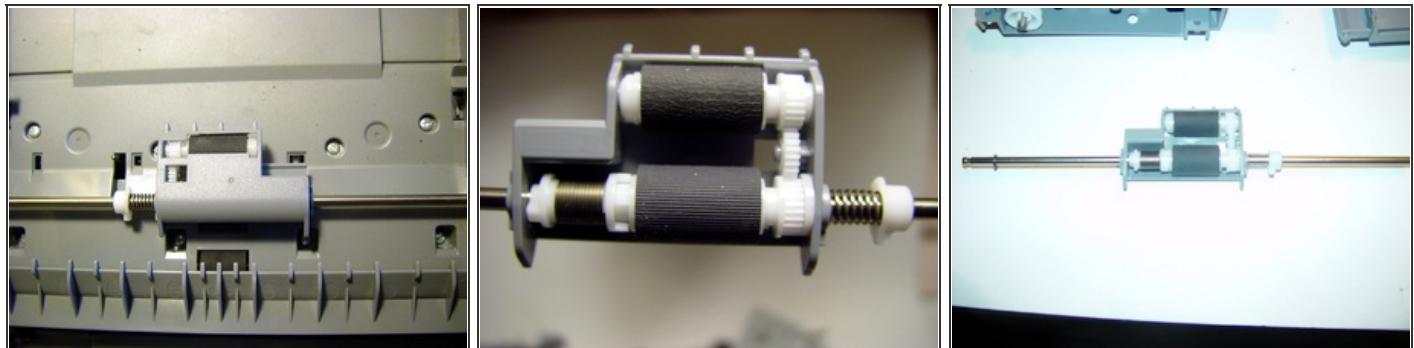
- Let's start by removing the top lid of this puppy. It has nice square hinges that just slide up out of the bottom assembly. You will have to cut the wires on one hinge to free the top.

### Step 3 — Paper Tray: Remove flaps & screws.



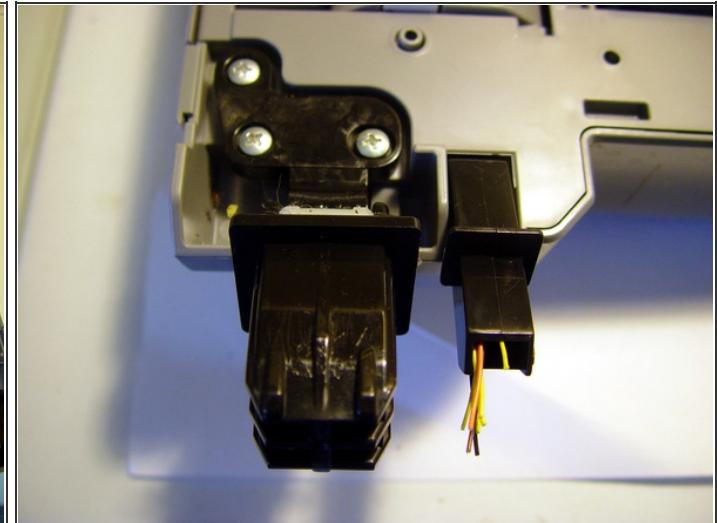
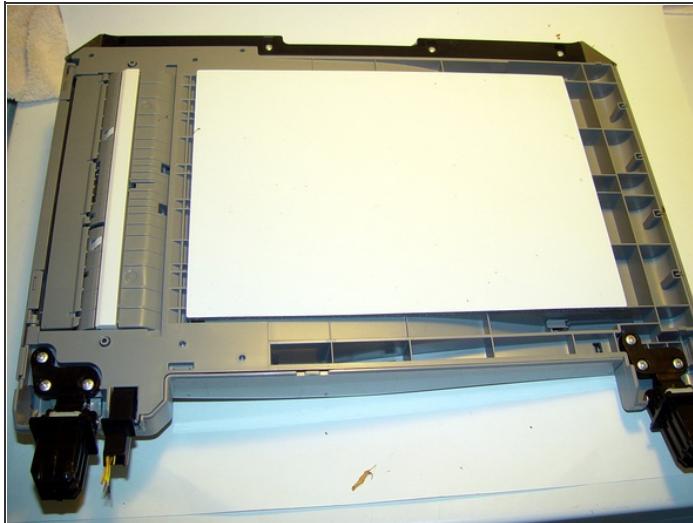
- Investigate the paper tray for any obvious screws, etc. to take off. Open flaps and remove from main body. Stash the plastic in the "salvaged plastic" bin for later.
- Aha!!!! Once the flaps are open the glisten of gold - or aluminum screws in our case - appears before our eyes. Get out the screwdriver and take 'em all out.

### Step 4 — Paper Tray: Feed Rollers!



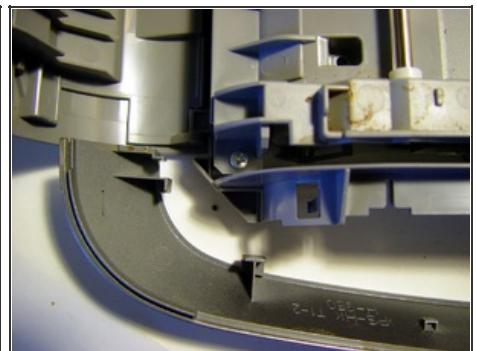
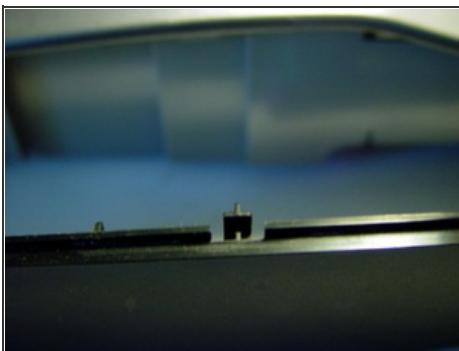
- Okay ... so we removed the screws and got this neat paper feed mechanism out. It has gears and rubber gripping rollers attached to a nice stainless steel rod assembly.
- Let's leave it alone until later ... should try to use the entire assembly in future projects 'cause it is so cool.

### Step 5 — Paper Tray: Flip over and remove screws.



- Nothing major here - easily-visible screws to remove. The white foam piece peels off and can be used as flexible white board or foam liner for tray or ???
- The hinges have a great feel to them as if they were hydraulic. Hold on to these for a project - they will be great!

### Step 6 — Paper Tray: Time to Pry!



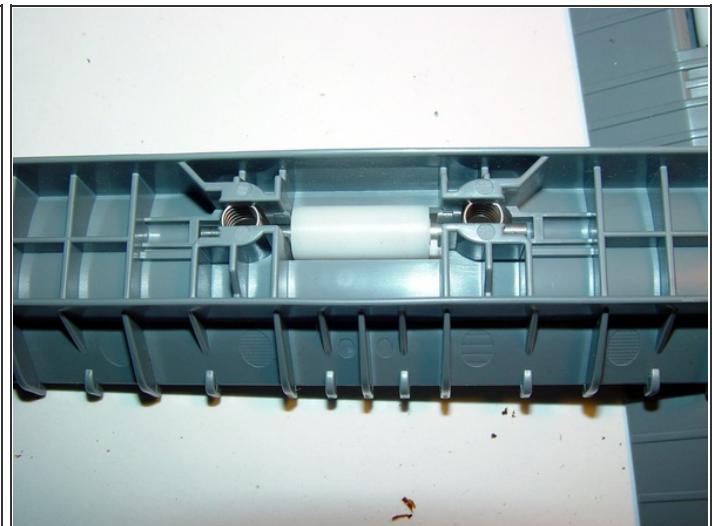
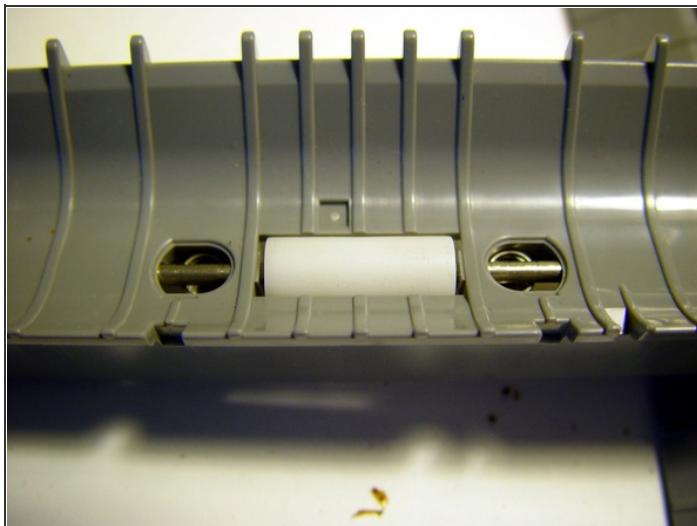
- Now that the screws are out we try to separate the tray into smaller bits - but we can't .... it's "stuck." What we have here, children, are hidden tabs and snap points that hold this puppy together. Time to get out the trusty flathead screwdriver or mom's best dinner knives (maybe not) and start poking and prying the plastic seams apart.
- You might want to put on safety glasses if you tend to really pry things apart. If you can remain calm you should be able to pry them open with no war wounds.
- Now that we have pried open the tray we look for more screws - and find them! You know the drill ... take 'em out and store in the "salvaged screws" jar.

## Step 7 — Paper Tray: The Naughty Bits!



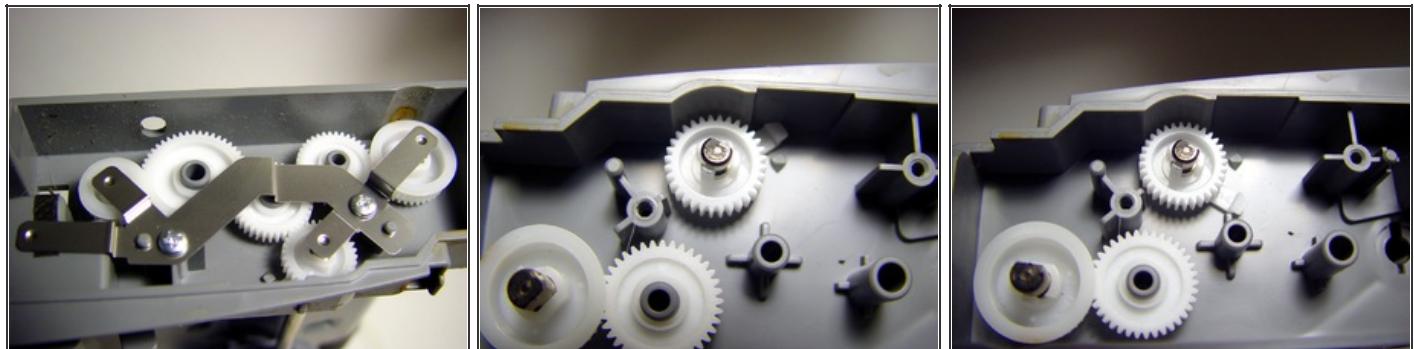
- Okay .... now we are in business. Now that the paper tray is a bit more exposed - you might say naked - we can see what treasures it offers.
- I see a motor ... not just a basic DC motor but a stepper motor (multiple wires). I actually expected this since a paper feed tray has to be able to grab the paper, feed it in 'til sensors tell it to stop, a little alignment, etc. That is the work of a stepper motor.
- See the screws? Remove the screws! But you might want to leave the motor attached to the metal bracket until you use them in a future project - you might use both motor and bracket together.

### Step 8 — Paper Tray: The Little Bits!



- Let us not forget the little bits just 'cause we get some big bounty (motors) from this eWaste. All these screws and plastic rollers and springs will come into use and save you money.
- If we gently pry out this roller with a small flat screwdriver we will end up with a roller, two springs, and a stainless steel rod - not bad for free.

## Step 9



- Paper Tray: Gears Galore!
- There be gears in them there hills!! Okay, maybe not hundreds but enough to keep and use later. I've never met a bad gear ... even the plastic ones have hope of reuse.
- What have we learned about screws? You know the routine - show those screws who really wields the screwdriver in your house - let them mingle with their fellow friends in the salvage jar.
- See that funny gear with the tab sticking out of it? The tab near the notch? The tab that can be moved away from the notch? That is the tab that you move when you want to remove the SS (stainless steel) rod that is attached to the gear... the gear with the tab... the tab near the notch...

### Step 10 — Paper Tray: Stainless Steel Rods!



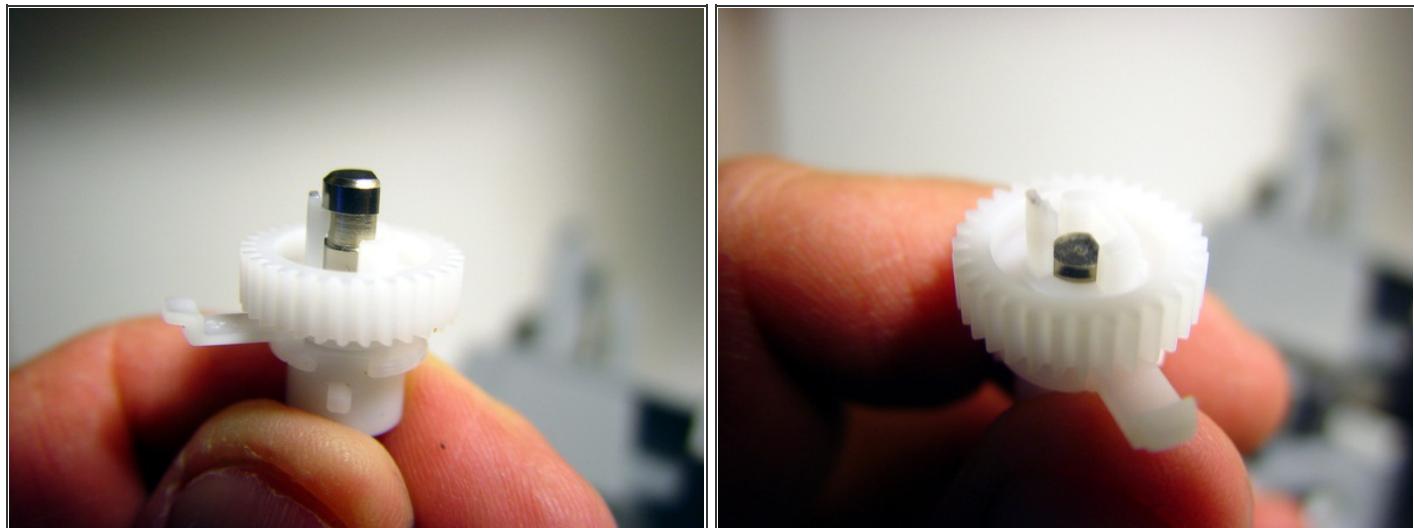
- Okay - Pop Quiz Time. Remember the gear in the last step? The gear with the tab? The tab next to the notch? The tab that moves to release the SS rod from its mounting point? Well this is the backside of that gear ... that gear with the tab ... the tab near the notch that it moves away from.
- Now we see the SS rod removed from its mounting point all because of a gear ... a gear with a tab ... a tab - oh, forget it.

### Step 11 — Paper Tray: Gears with Tabs!



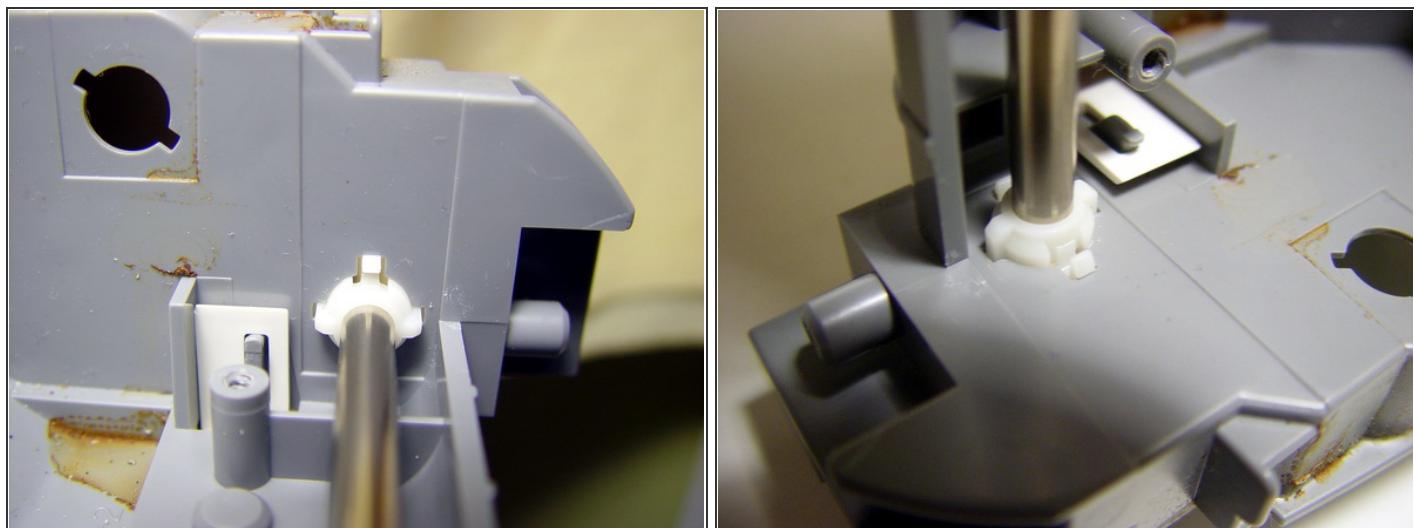
- Do I need to repeat myself? See previous step lest I unleash more prose on you.

### Step 12 — Paper Tray: More Gears with Tabs!



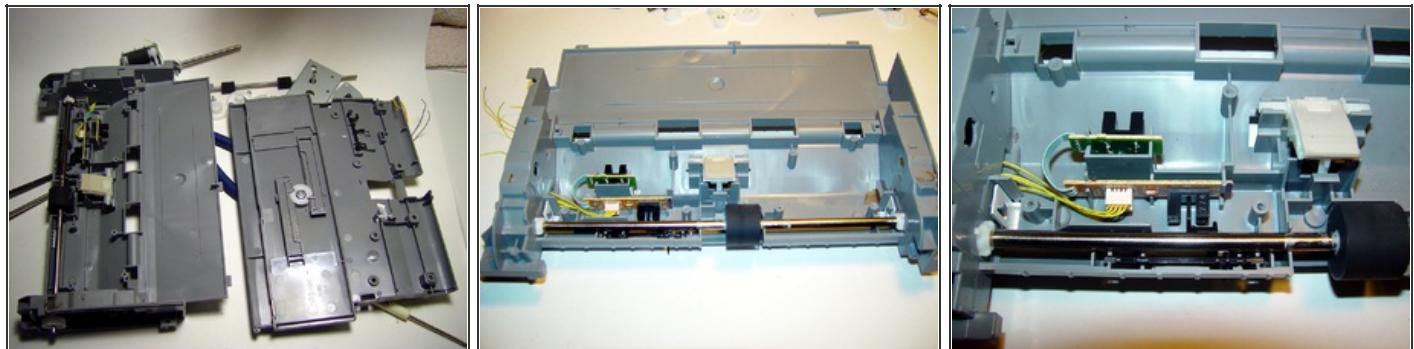
- Look closely and we can see the tab that prevents the gear from coming off the SS rod. Using a small flat screwdriver we will pry that tab back while pressing the gear off the rod.
- Slides right off!

### Step 13 — Paper Tray: More Tabs, No Gears!



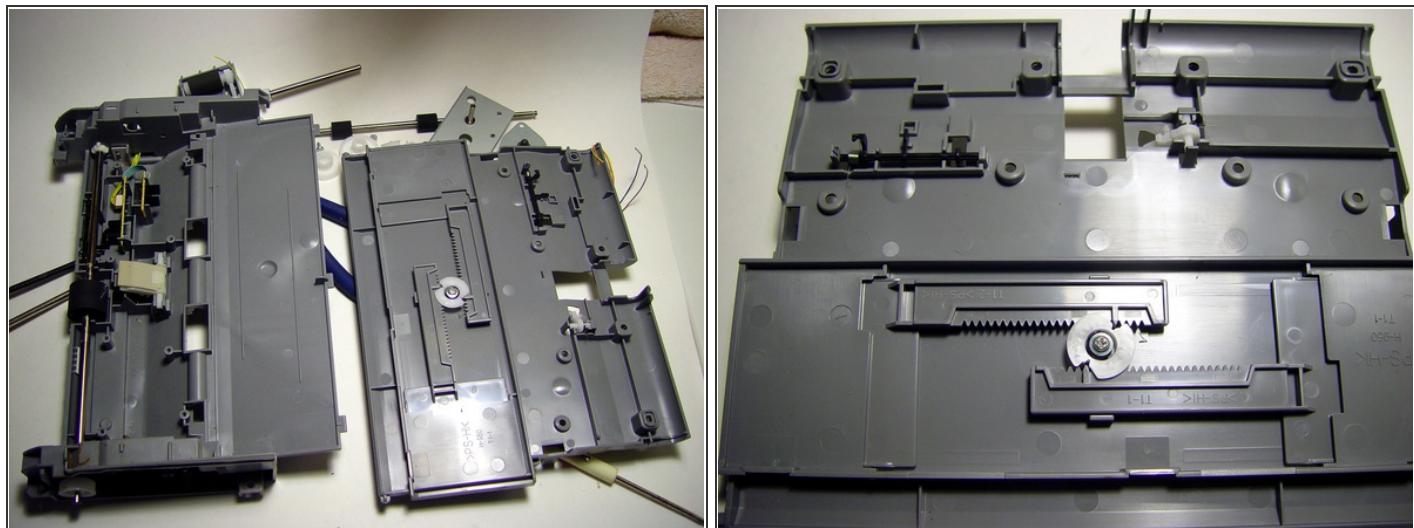
- Another example of tabbed connectors that secure rods in place. This one has no gear attached. Just poke tab out of slot to release.

### Step 14 — Paper Tray: Electronics Inside!



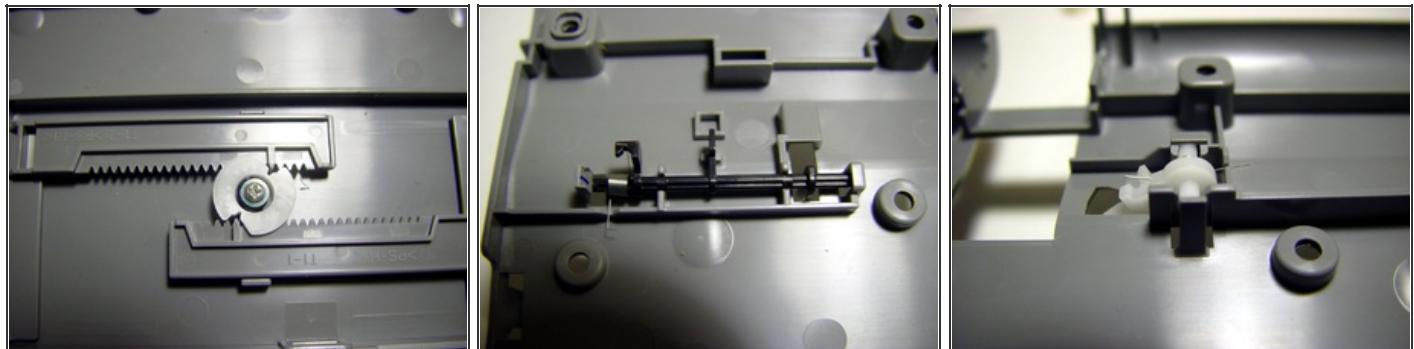
- Now we can see what the motor and gears and rods were all there for ... to feed paper from up top to underneath. Here are the electronics that it used. These are paper-out sensors and top-of-page sensors. Keep them for future use.
- See any screws - take 'em out. See any tabs - un-tab 'em. Remove anything removable. Continue at your own pace.

### Step 15 — Paper Tray: Almost done ...



- Okay - we have gutted the left side for all its bits - now let's gut the right side for its stuff.

## Step 16 — Paper Tray: Last Little Bits!



- Okay - remove screw - pry out springs, etc. and we can say that the paper feed tray is salvaged for all its parts. You did get the little paper-out lever and white roller thingy - right?

## Step 17



- Paper Tray: The Booty Call!
- Here are some of the major pieces off the paper feed tray. Cherish and fondle 'cause they are yours and free for the dismantling
- Take a break - get some water - clear your head and walk around. Why, you ask? Because we are about to delve into more dismantling of this Canon and we don't want you to pass out on us - so get refueled and report back for duty ASAP!

### Step 18 — Remove Scanner / Copier section.



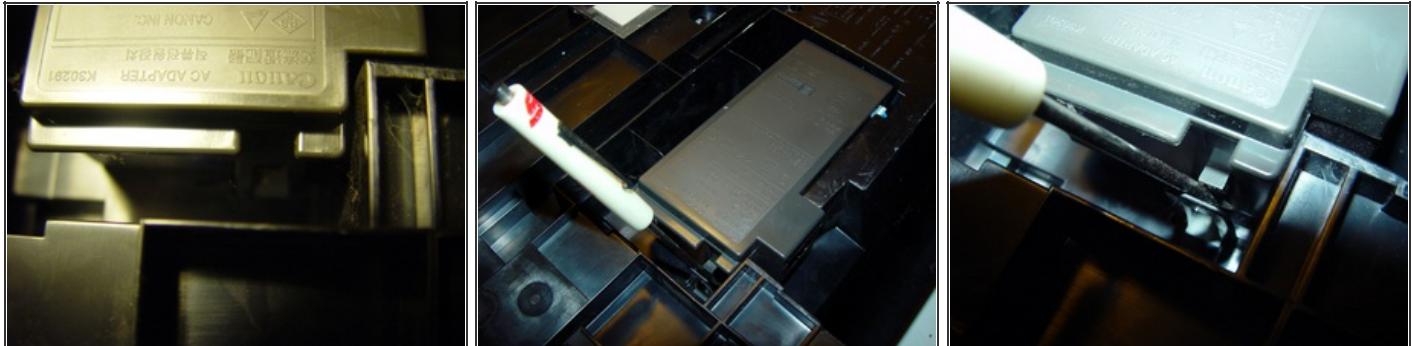
- Back to the main carcass we resume the usual routine of looking for screws and tabs to remove. Obvious ones near the square hinge holder get removed first.

### Step 19 — Remove Power Supply.



- While looking for screws to remove on the back panel ... you see them? ... it looks like the power cord plugged in here. Let's check it out.
- Flip the whole thing over and we see a power supply unit nestled into the bottom. Input is 120Vac ... Output is 24Vdc
- Look closely to see what is needed to remove it.

## Step 20 — Prying out Power Supply.



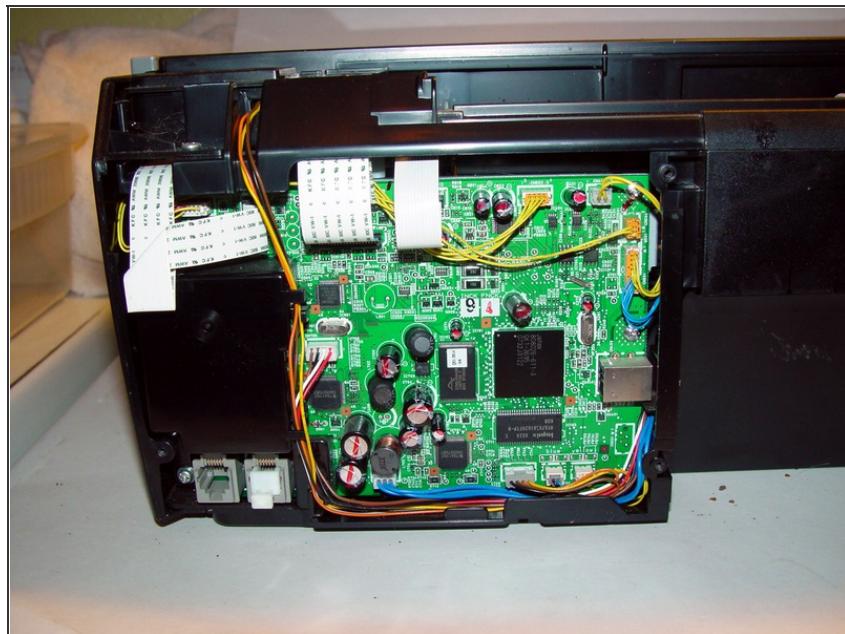
- So a tab holds in this power supply. Use a small screwdriver to pry it back while lifting out the unit.

## Step 21



- Power Supply: Remove and Unplug.

## Step 22



- Disconnect the ribbon cable.
- The rest of the wires will be molex-type connectors that can be pulled off.
- Remove the screws and pull out the circuit board. You have some choices here: recycle the PCB properly, use it to make a nifty PCB clock, or embed it in your next terrazzo floor or cast-concrete countertop!
- Capacitors are cheap, but consider salvaging them anyway because free is the best kind of cheap.

## Step 23



- Insert wisdom here.

### Step 24



- Insert wisdom here.

### Step 25



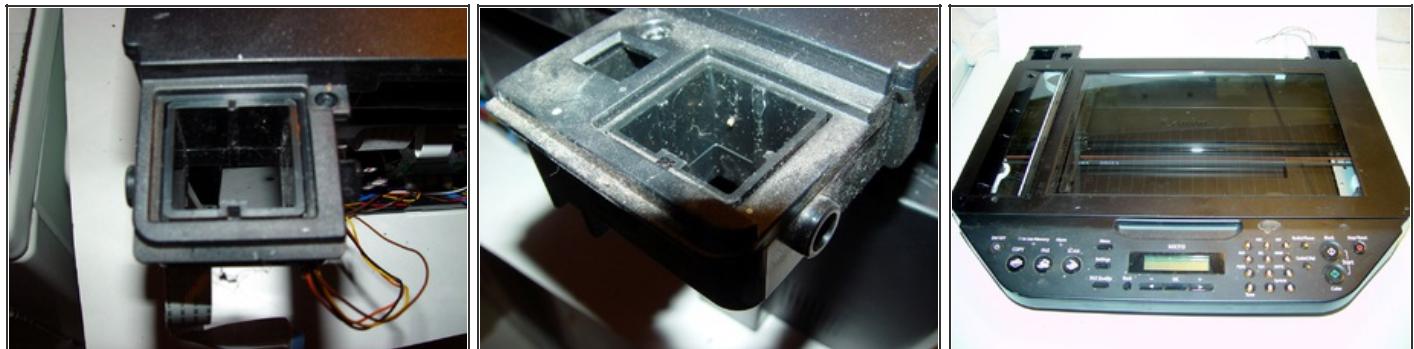
- Insert wisdom here.

### Step 26



- Insert wisdom here.

## Step 27 — Scanner / Copier Removed!



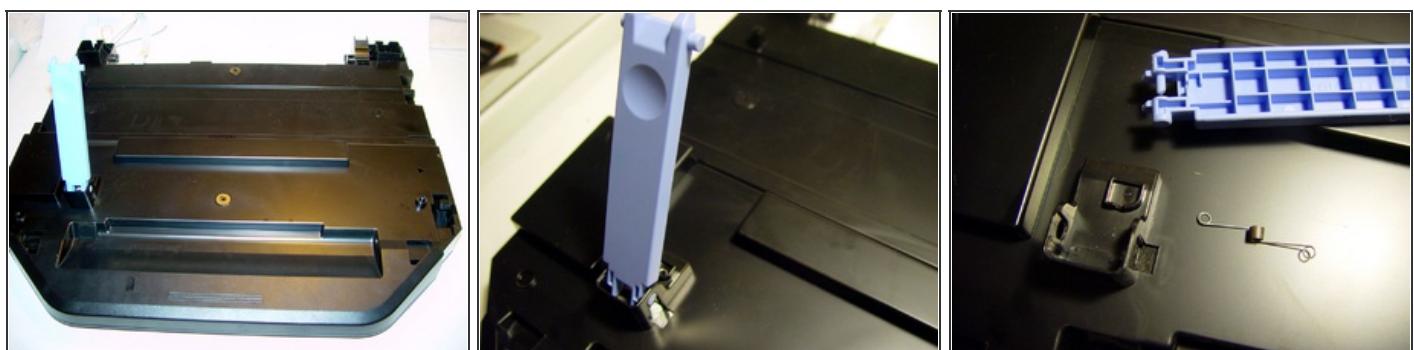
No instructions yet.

## Step 28



- Insert wisdom here.

## Step 29 — Scanner: Flip Over - Remove Bits



- The underside of the scanner has a couple of pieces you should get. Flip over and remove lever that holds up lid and spring related to it.

### Step 30 — Scanner: Pry off button panel.



- Remove plastic cover from button assembly by prying under edges with a small screwdriver. It was snapped on so removal is fairly quick. Unsnap it.

### Step 31



- Scanner: Remove Button Assembly.
- With the cover off we see screws we need to remove. Once those are out you can take out the button assembly.
- A ribbon cable is attached but it pulls out easily.
- Flip over the assembly .... guess what we do with the screws? NOTHING YET ... I am saving the tear-down of this for later ... but you can remove screws if you must.

### Step 32 — Printer: Start Shedding the Skin



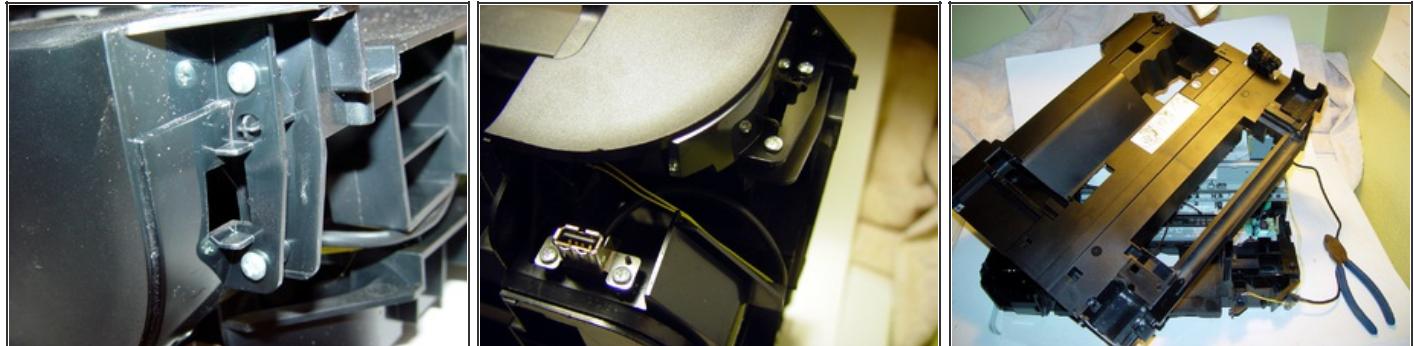
- Okay - Back to the printer carcass. Look for all visible screws and remove them, but most of those are probably hidden behind snapped-on plastic panels. Let's pry off those panels ... no need to be gentle.

### Step 33 — Printer: X Marks the Spot.



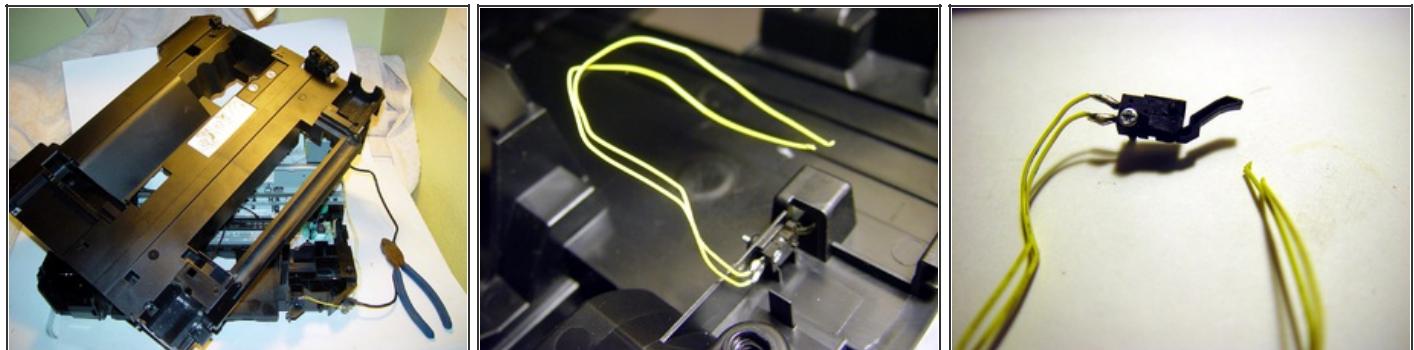
- There are tabs that need to be pried open. Luckily they are not so hidden and marked with an arrow (not an X) ... you can see them in the pics of the side panels removed ... go ahead and pry them open.
- Almost ready to shed the plastic shell ... a couple of things holding it together ... so on with another step.

## Step 34



- Insert wisdom here.

## Step 35 — Printer: Paper-Out Switch! Treasure!



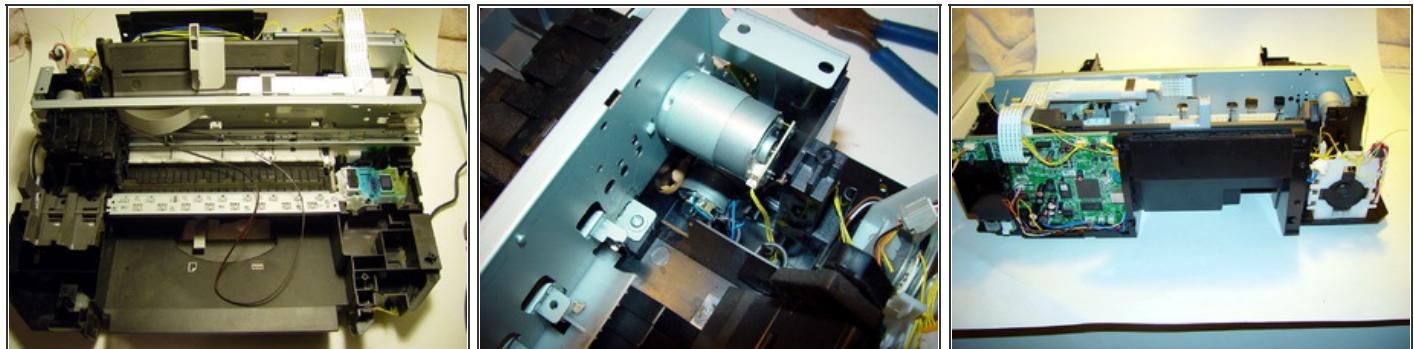
- Before you throw away the plastic printer shell you need to check for precious bits.
- See that square hole in the shell ... down in the lower left of pic? Flip the shell over and look at that spot ... what do you see?
- Paper-out switch!!!! yea .... applause ... this little switch will be gold when you need to add obstacle detectors on a moving robot. Keep this puppy handy.

### Step 36 — Printer: Thar be Gears There!



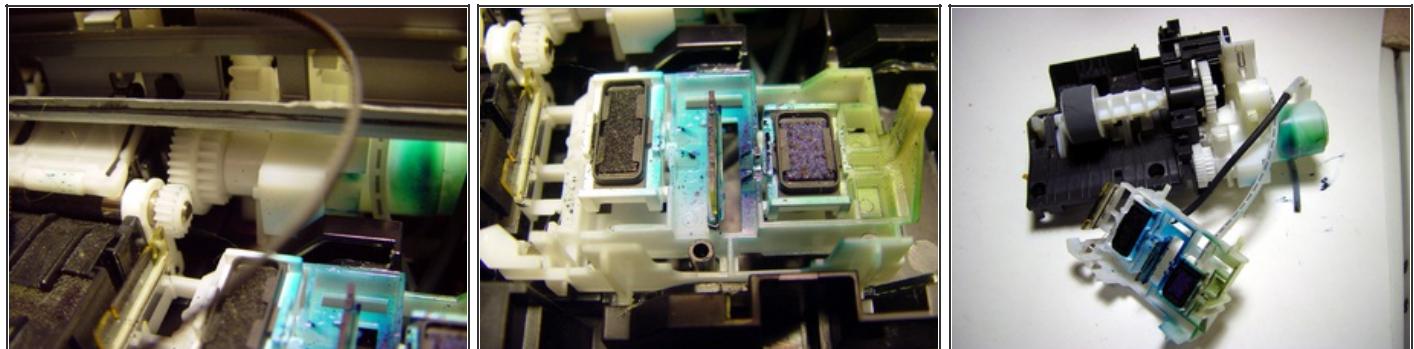
- When we took a panel off one side of the printer we spied this gear assembly. Gears good ... gears make me drool ... gears good.
- Take the screws out (you knew that - didn't you?) that attach the gear mechanism to the printer body. Remove the mechanism.
- You can leave it as is for later or go ahead and dissect the mechanism for the indy gears and bits. Fondle at will.
- Bag & Tag! Keep the mechanism and parts together ... you may want to use the entire assembly later.

### Step 37 — Printer: Continue with unMaking



- Back to the printer body remains. Take a look at the goodies ... more motors ... more gears ... more electronics.
- Motors!!! I actually see two down there ... expected to see two since a printer needs a motor for the ink cartridge axis that moves the printheads and a motor to move and align the paper.

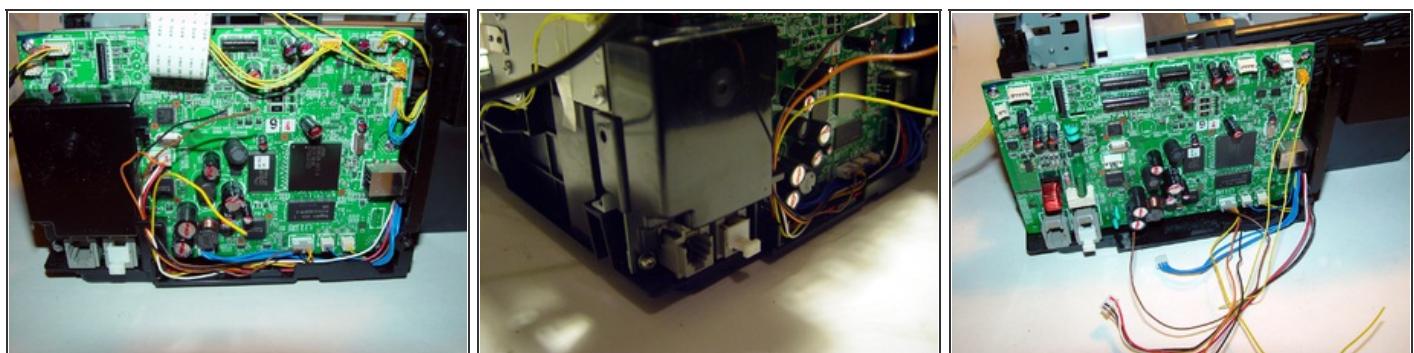
### Step 38 — Printer: The Gears are Guarded!



- Sometimes things are not so easy. Here we have lovely gears to get to but they are in the proximity of the whole ink pump / head cleaning station that holds nothing but a mess. Old ink and tubes with crud, etc. So tread lightly through this inky quagmire.

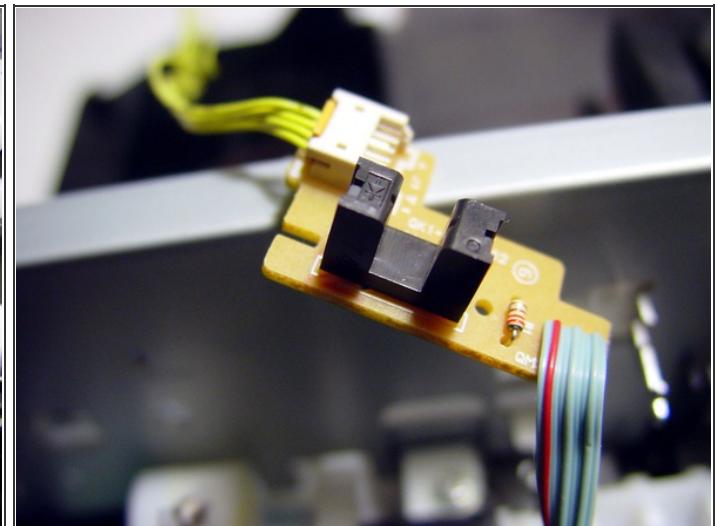
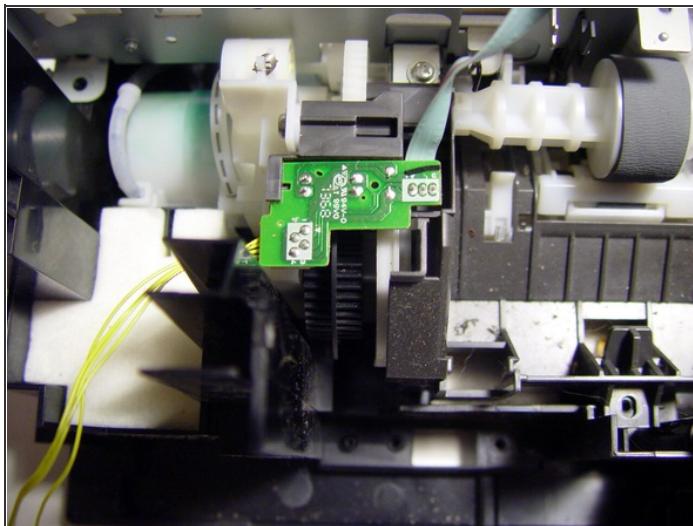


### Step 39 — Printer: Electronics to Remove



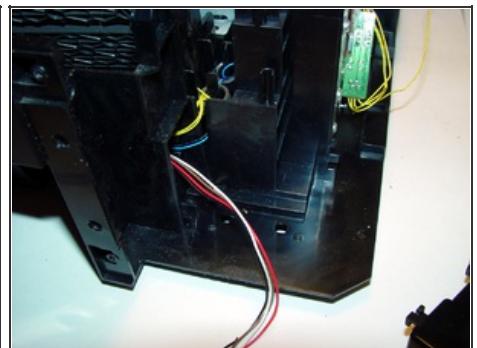
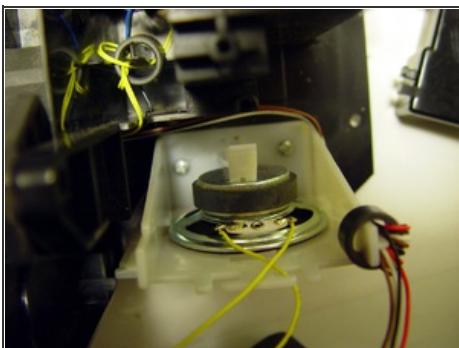
- Electronics!! I think we already removed a USB cable / plug-in port thingy earlier - right? Well, let's not forget the phone plug jacks (with nifty plastic plug for non-used port).
- Circuit board goes. Remove as many wires off the board as possible.
- What stands in your way of getting these items? Screws! You know the drill - just don't use one 'cause a screwdriver will work better.

## Step 40 — Printer: Tiny Electronic Circuits



- Don't forget to look for sensors, etc. that are housed on their own little circuit board. They often hang out near the ends of paper rollers and axles so they can monitor rotation and such.

## Step 41 — Printer: Speak Out!



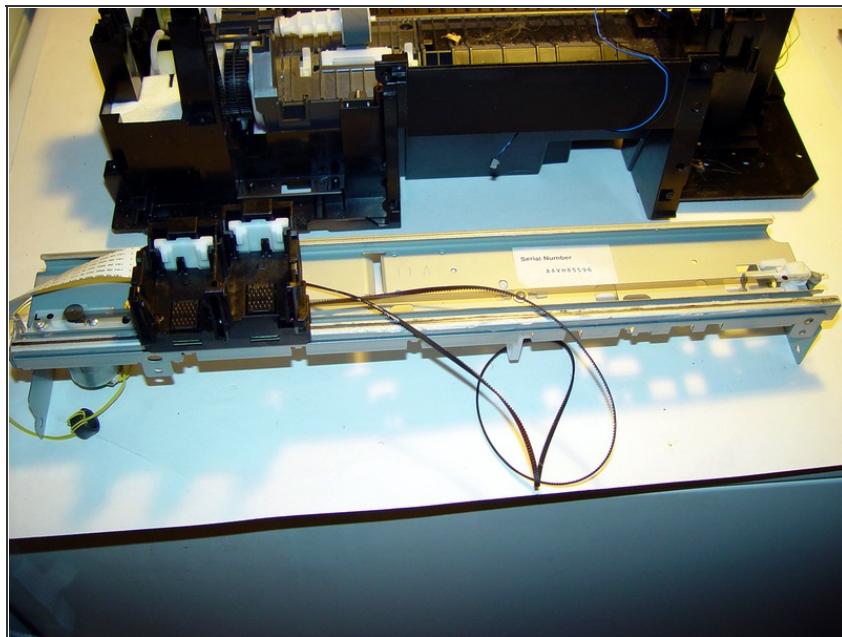
- Time to take the speaker out. Unwrap and remove any wires that you can.
- Pull back white tab to remove speaker from white housing (keep).
- Remove housing by removing screws. Put speaker back in housing once removed ... store together since made for each other.

### Step 42 — Printer: Look for Little Bits



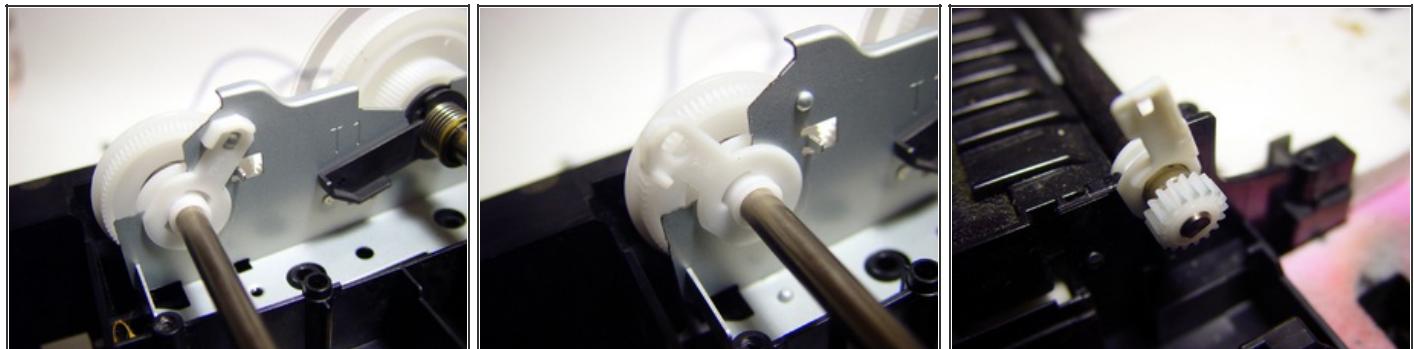
- Scrounge around for springs and rollers and pins and rods that are quickly removed.

### Step 43 — Printer: Ink Cartridge Guides



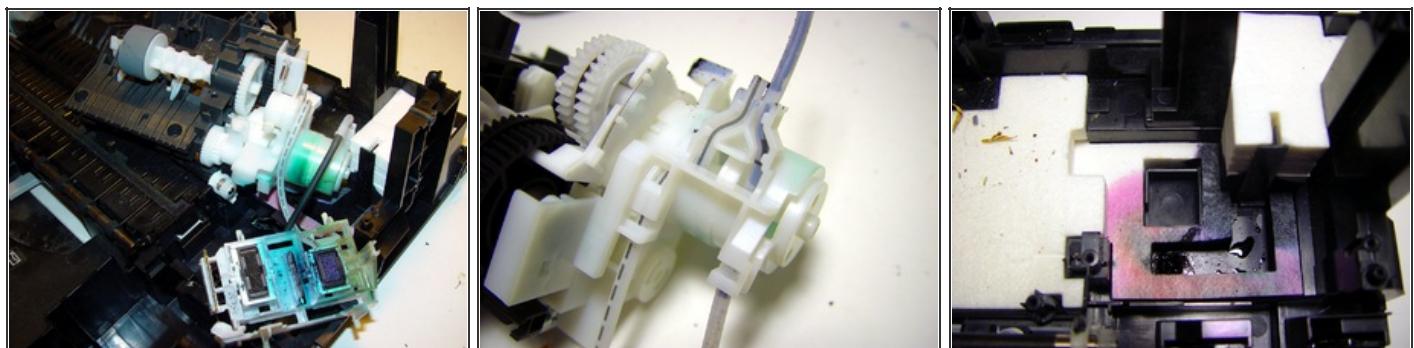
- Removing screws should yield this ink cartridge guide structure.
- Set aside for later destruction.

### Step 44 — Printer: Please Release Me



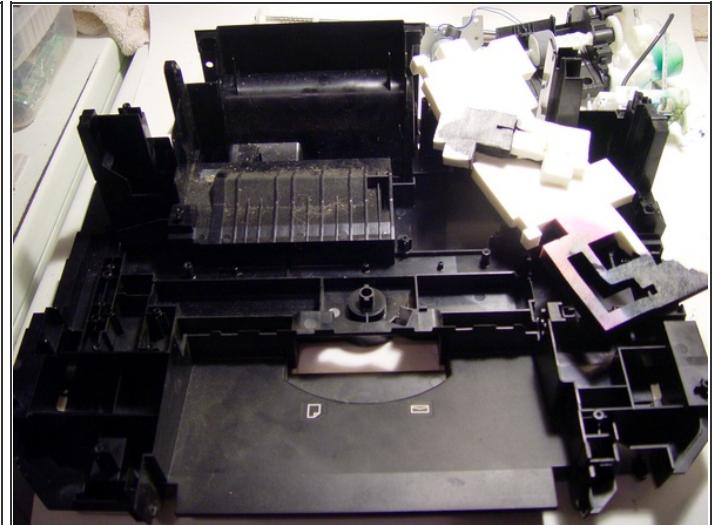
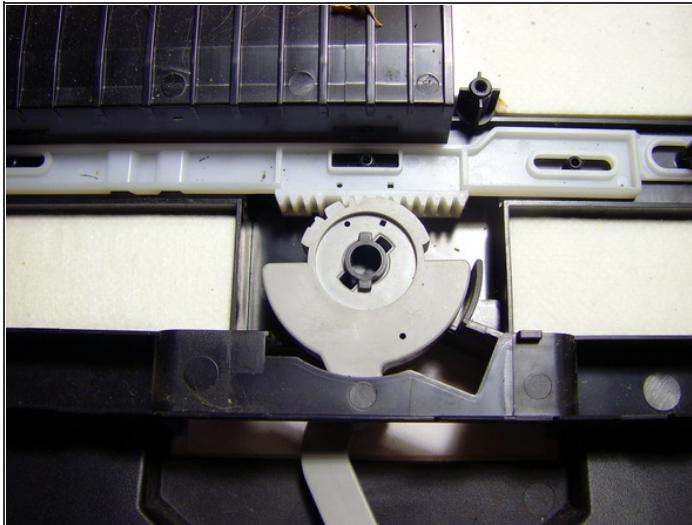
- The stainless steel (SS) roller bars are held in with tabs that unlock the rod if you release the tab from its notch and rotate so that it can slide out of the printer body.
- Try to find and unlatch as many roller bars as possible.

### Step 45 — Printer: Remove Ink Pump



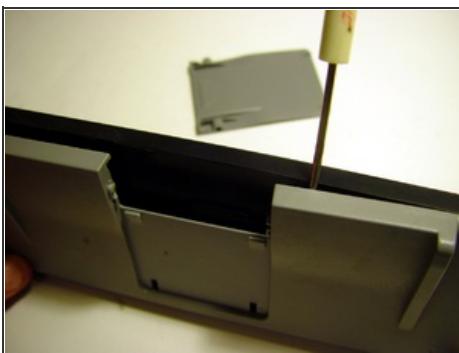
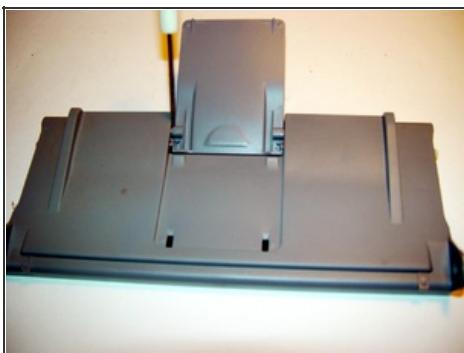
- This is messy so take your time. Once you remove the rollers you should have access to the gear cluster and ink pump thingy. Remove and bag it.
- Foam pads have soaked up some ink so if you remove and toss it should be easier to handle.

## Step 46 — Printer: Last Little Bits



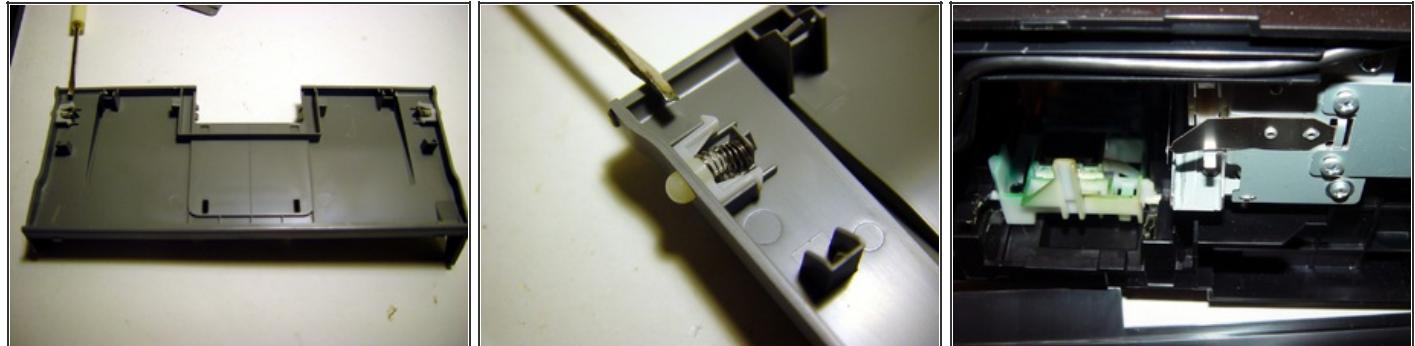
- All that remains in the printer body is a miscellaneous lever that can be removed if you line up the tabs.
- The printer carcass is stripped down and ready to recycle. Take care to dispose of those ink pads carefully.
- If any ink pads have stayed clean you can use them for blotting up things. I use them in my soldering station to wipe the soldering iron tip on to keep it clean.

## Step 47



- Printer: More Little Bits!
- Look at the miscellaneous paper trays and drawers that came with this printer. If you see any buttons or springs or whatever .... pry apart to get to the innards and remove the goods.

## Step 48



- edit this out ..

## Step 49 — Scanner: Get Back to It!



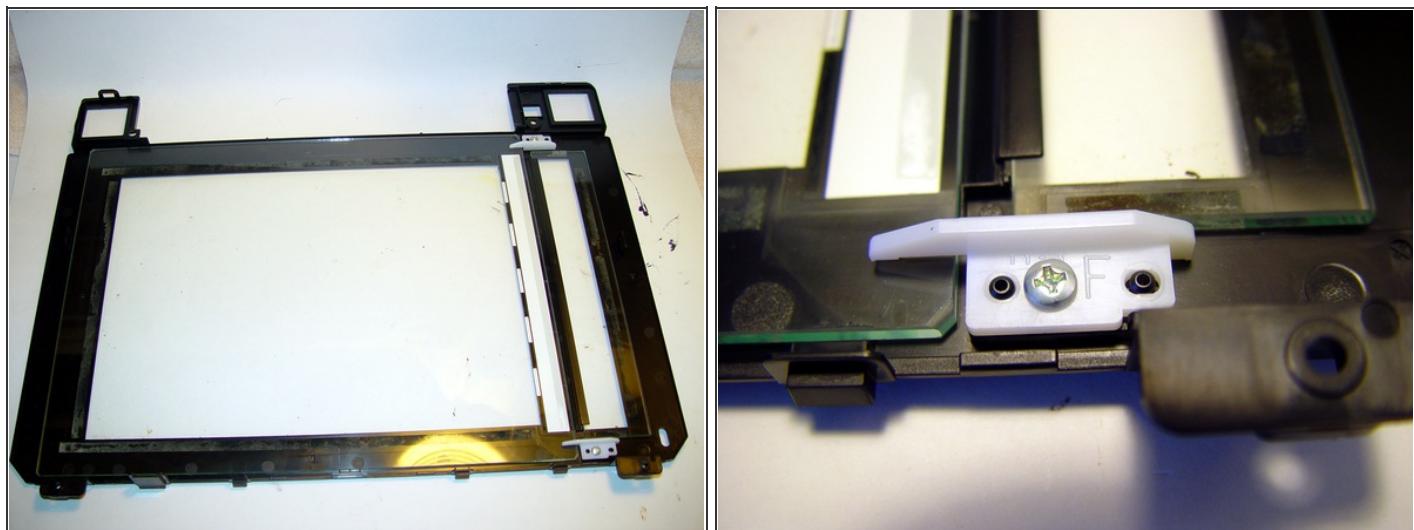
- Okay - time to get back to the teardown of the scanner.

### Step 50 — Scanner: Screws & Tabs



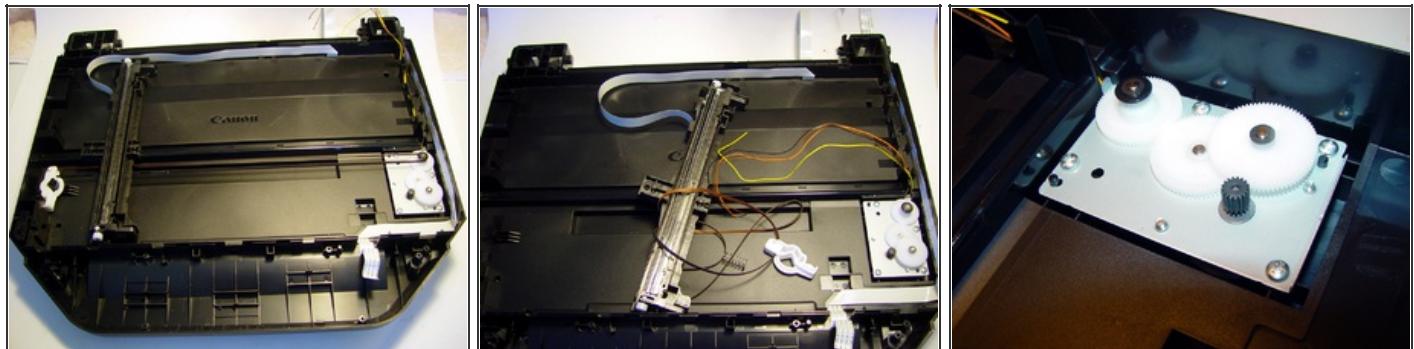
- The usual culprits are keeping this together .... screws & tabs ... you know what to do ....

### Step 51 — Scanner: Glass Platen



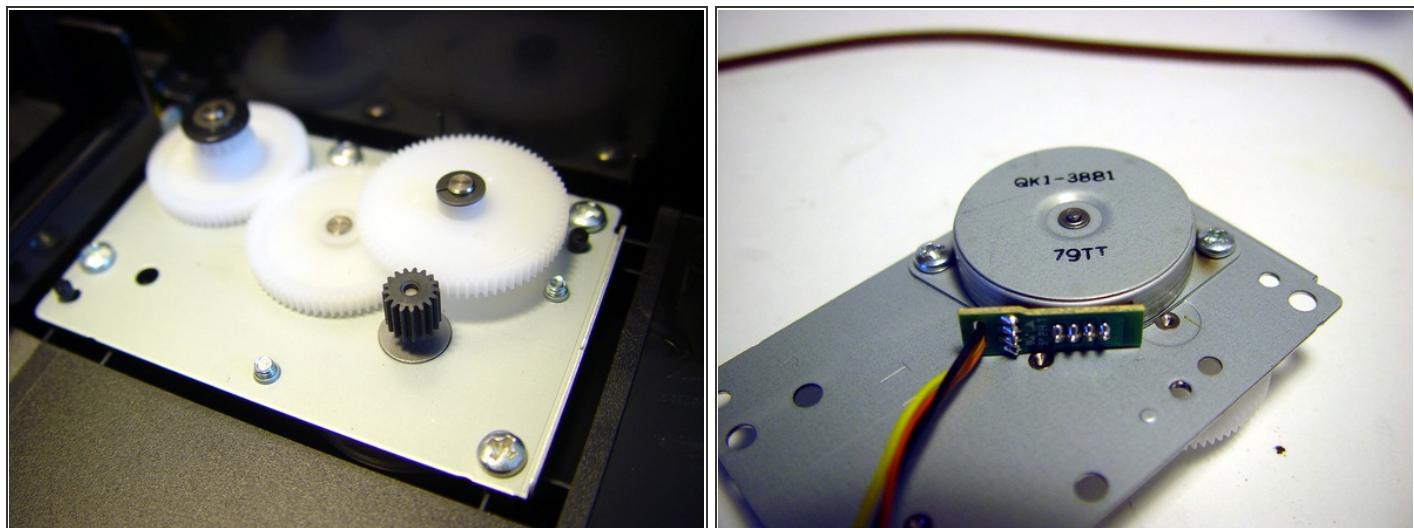
- Once tabs are removed you can peel off the plastic layer with the scanner glass in it.
- If you want to remove the glass from the plastic you need to remove the white tab with the "F" on it.
- I chose to leave the glass & plastic together for now. It might become part of a light box or tracing table.

## Step 52 — Scanner: The Big Score!



- You see the motor? That is a stepper motor and makes this whole teardown worth it. That baby is gold!
- The scanner unit travels back and forth, to and fro, here and there along a small rail system they built into the plastic housing. This is cheap and the scanner head lifts out easily. So do most of the wires and hardware in this unit. Take out what you can.
- Now take a screwdriver out and get to the motor. Try to remove the whole unit and leave intact for now.

## Step 53 — Scanner: Stepper Motor



- Here it is ... a beautiful stepper motor ... with info on the back. When I google that I find what? (Google and post results.)

### Step 54 — Scanner: Gleaned Clean ...



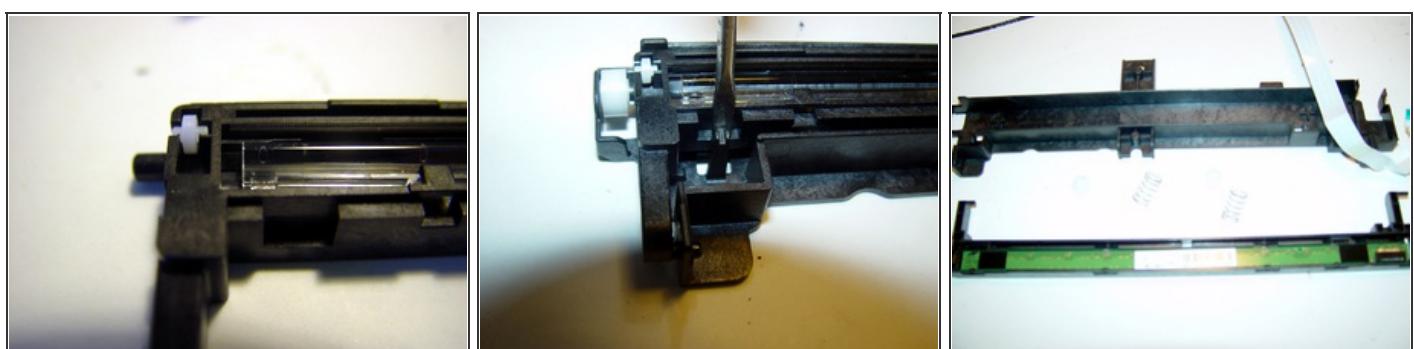
- All that is left is to tear apart the button assembly ... another step for that ... for now - gather up the scanner bits and put all together for a photo op.

### Step 55 — Scanner: Scan Head Unit



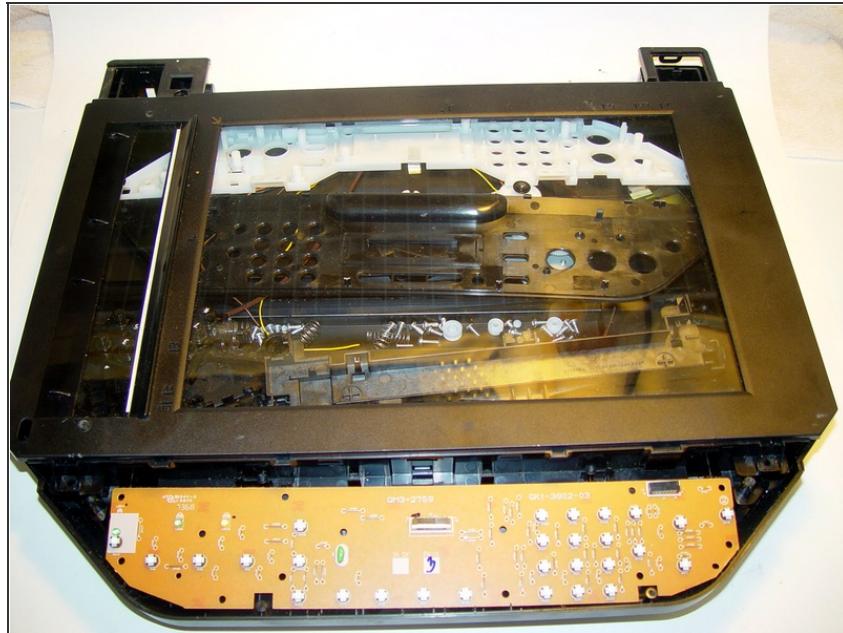
- The scan head unit has some tabs to pry apart in order to get to its innards. Pry open and remove small bits.

### Step 56



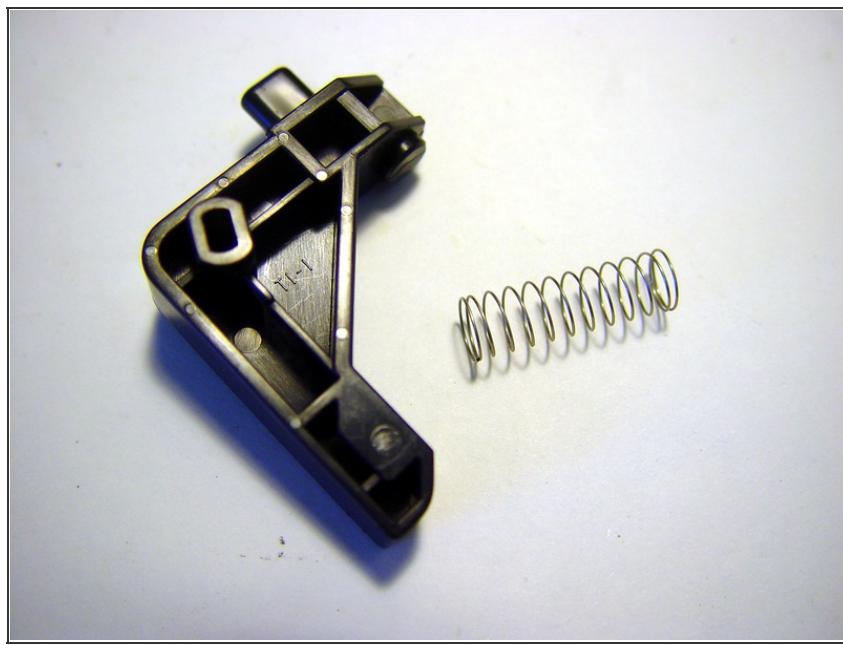
- Insert wisdom here.

## Step 57 — Scanner: Booty Haul



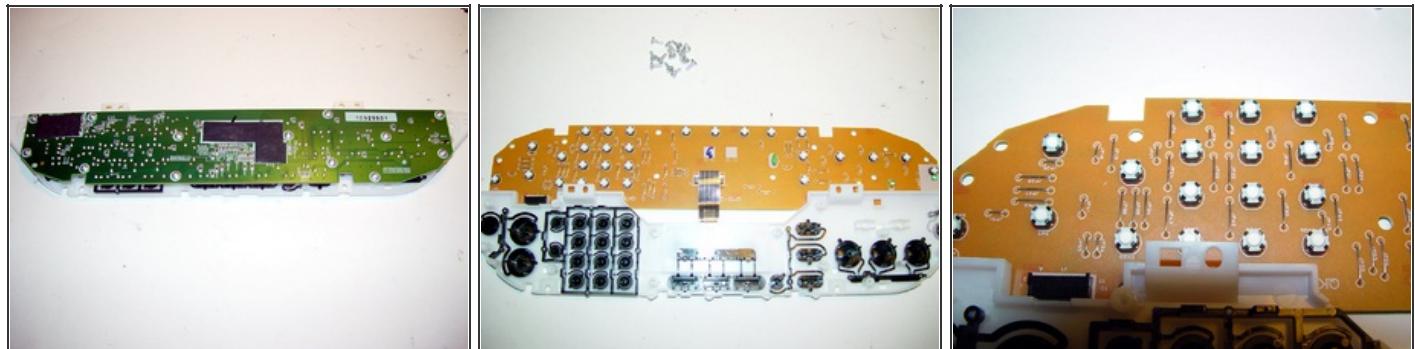
- See what nice parts that generated?

## Step 58 — Don't Forget the Little Bits!



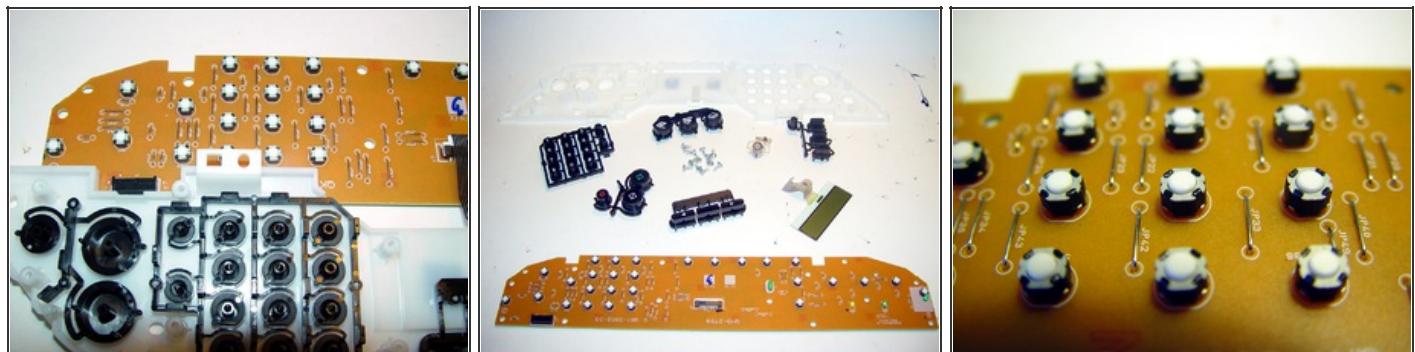
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### Step 59



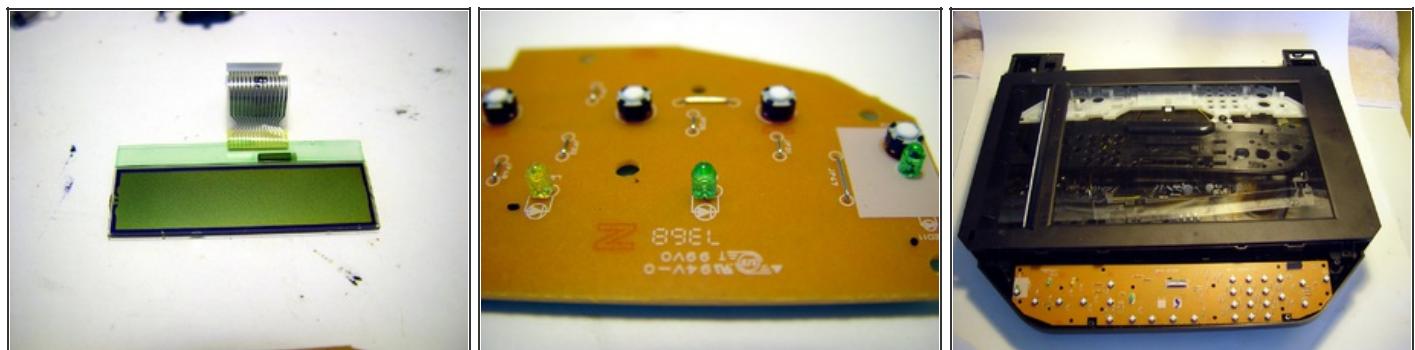
- You can remove the buttons or use it to build a game with an Arduino.

### Step 60



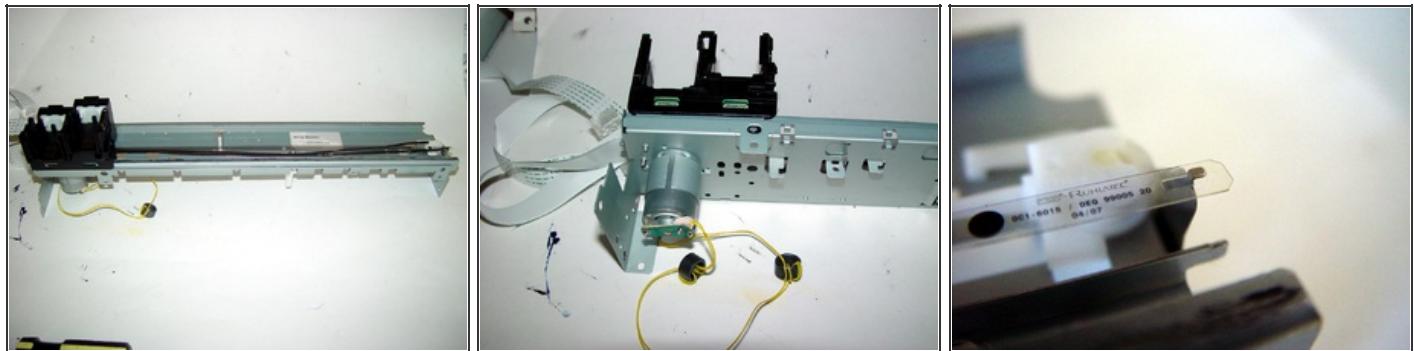
- Insert wisdom here.

### Step 61



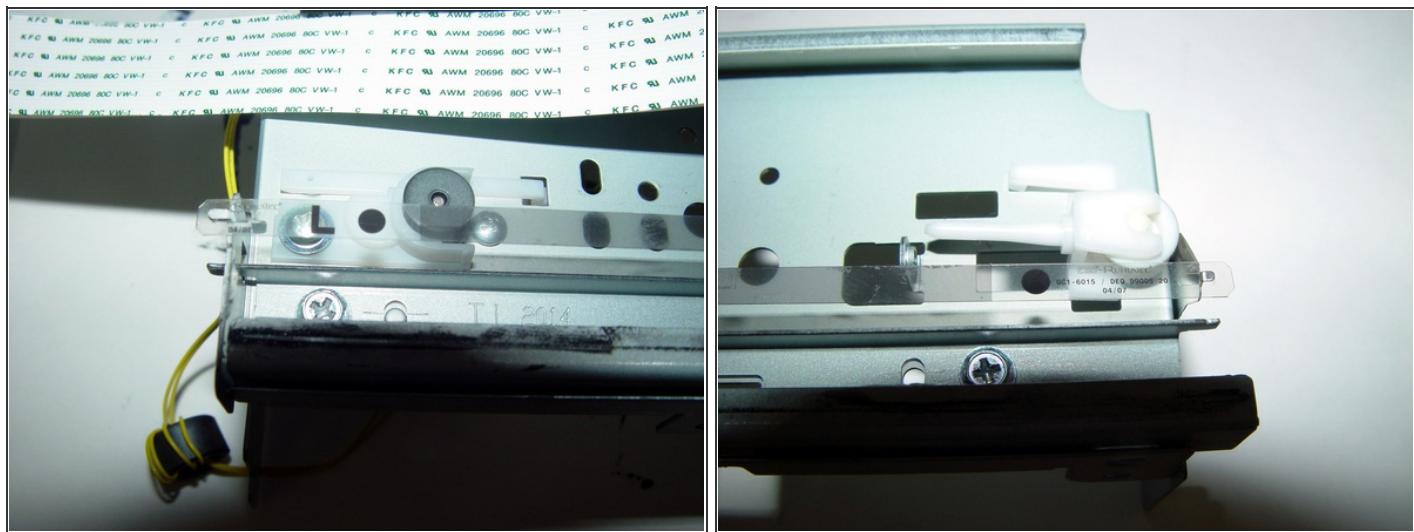
- Insert wisdom here.

## Step 62 — Ink Cartridge Chassis: Tear it Down



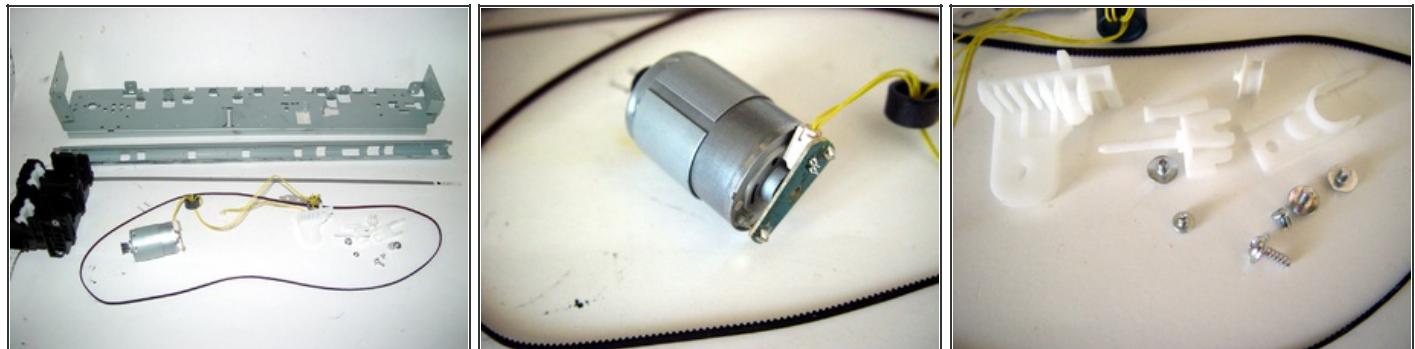
- Usually I leave these things intact until I know what I want to do with them. Often they are best kept as a unit 'cause you can get rid of the ink cartridge and replace it with something else to be controlled on an X-axis with the motor.
- Yes .... a motor ... the real treasure in this unit.
- Often a little plastic strip is attached to a small tab ... it pulls off easily.

## Step 63 — Ink Cartridge Chassis: Remove Screws & Tabs



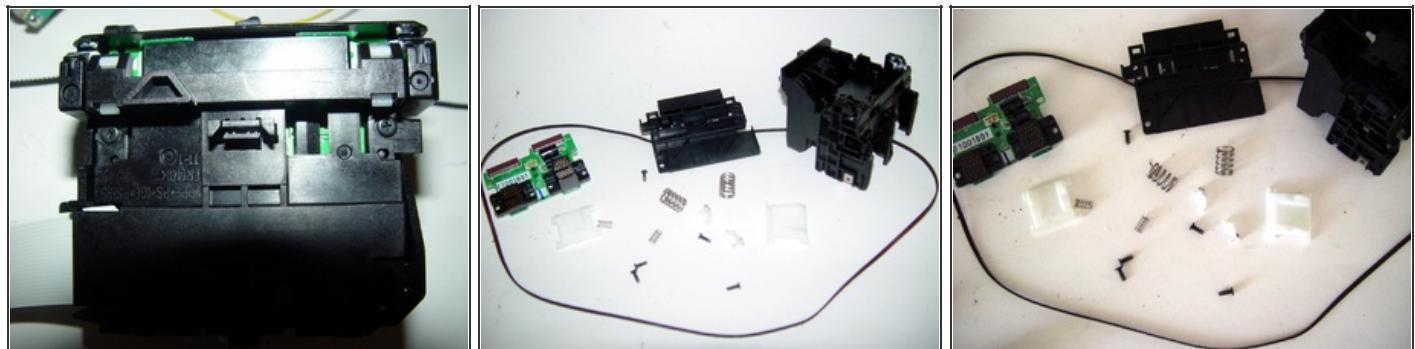
- You thought you were done with the screwdriver? Ha! Back to the routine of finding screws to remove and tabs to turn or snap off.
- Aside from the aforementioned plastic strip there are roller pulleys and springs to harvest in this piece.

## Step 64



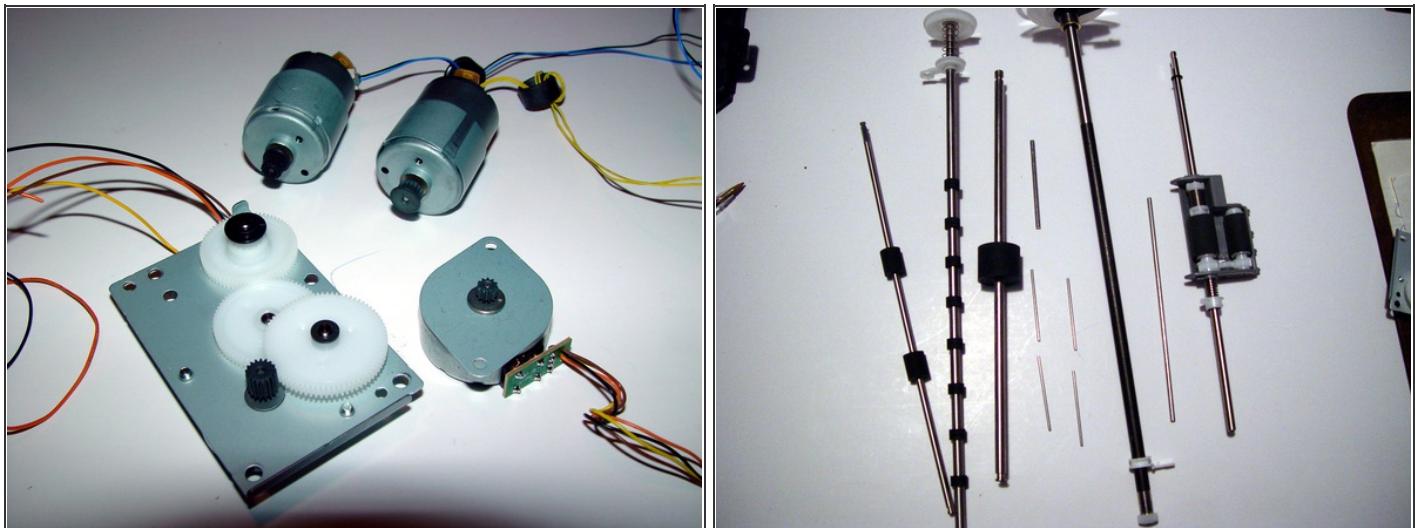
- Ink Cartridge Chassis: Booty Haul!
- We've got a motor, ribbed drive belt, rollers and hardware, plus the metal chassis itself to recycle for cash. Not a bad haul for a small unit.
- The motor in this unit is a ????? (will look up specs online & post).

## Step 65 — Ink Cartridge: Scrounge for Bits



- The ink cartridge housing has a couple of tabs that need to be pried open and a screw here or there. Look around and remove.
- See what that generated ... not bad for nothin'.

### Step 66 — Canon unMade: Motors & Rollers



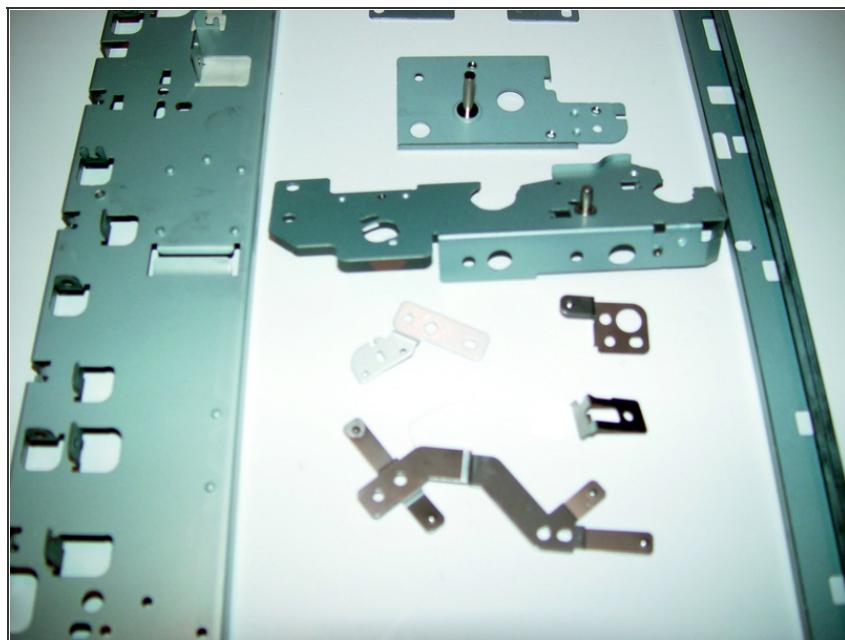
- What a haul ... 4 fine motors and several SS roller bars.

### Step 67 — Canon unMade: Plastic Scrap



- Sort and collect the plastic into boxes / bins. After a few unMakings of eWaste you will have enough scrap to take to a recycle center, if they take plastic, or an eWaste event drop-off.

## Step 68 — Canon unMade: Metal Scrap



- Save the metal bits and when you have a boxful you can take it to the cash-for-metal recycling center. Try to sort by type: stainless steel, aluminum, basic steel, etc.

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